



# Opportunity X

Bringing science research opportunities to underrepresented groups

## Opportunity X Science Research Project Ideas

### Scientific Projects:

#### Plants

1. What factors affect seed germination?
2. What amounts of light promote algae growth in a fish tank?
3. What medium is best for seeds to sprout?
4. How does temperature affect the water uptake of celery plants?
5. Which parts of a bean seed are needed to grow a healthy bean plant?
6. How are transpiration rates affected by the measured area of a leaf?

#### Animals:

1. How does size affect the breathing rates of tropical fish?
2. How does temperature impact the activity of ants
3. How does the time of day affect the problem solving ability of a hamster in a maze?
4. How does surface affect the travel rate of a caterpillar?
5. What foods do worms prefer in a compost bin?
6. Which conditions attract the most insect pests (mosquitoes, flies, gnats)?
7. What natural products are best at repelling insect pests (mosquitoes, flies, gnats)?
8. What conditions affect the sleep of domesticated puppies?
9. How does temperature affect the development of a caterpillar?
10. What type of food and feeder will attract the most cardinals?
11. How does moisture affect the tunneling ability of ants?
12. How do laws/policies on deer affect deer populations?
13. How do the behaviors of domesticated cats compare to the behaviors of wild cats in zoo captivity?
14. Are natural sponges more absorbent than synthetic sponges?

#### Health / Human Body

1. What conditions impact productivity while doing homework?
2. How does smell affect taste?
3. How do different style pencils or grips affect writing fatigue?
4. Which brand of skin moisturizer lasts the longest?
5. Do reflexes change with age?

6. How does photo-editing affect perception?
7. How do different liquids affect the health of a simulated tooth?
8. How do different types of movement activity affect human heart rate?
9. What conditions improve short term memory?
10. How does air moisture affect healing time of a stuffy nose?

## Microorganisms

1. What is the best way to reduce odor in shoes?
2. At what temperature does a yogurt culture grow best?
3. How does the location of water samples affect the number of microorganisms observed?
4. What conditions keep bread mold from growing on bread?
5. How does the bacteria in the mouth of a human, dog, cat, or hamster compare?
6. What conditions improve bread yeast growth?

## Environment

1. Does recycled paper decompose more quickly than non-recycled paper?
2. Which type of inside window covering is best for saving energy?
3. How does oil affect the growth of aquatic plants?
4. How does acid rain affect plant growth?

## Weather

1. How does a surface affect the rate it is warmed?
2. Does the sun heat saltwater and freshwater at the same rate?
3. How does topography affect wind speed?
4. How does air temperature affect the rate of evaporation?
5. How does weather affect mood?
6. Which method is best for melting icy pavement?

## Geology

1. Which type of soil can hold the most water?
2. Which conditions stop erosion the best?
3. How do different liquid solutions with varying pH levels affect rocks?
4. What conditions are best for making the tallest sandcastle?
5. What factors are best to grow sugar crystals?
6. Do major earthquakes cause minor earthquakes nearby?
7. Which structure of model house is best at withstanding a model earthquake?
8. What is the best way to clean or remove deposits from a copper penny (or other precious metal)?

## Space

1. How do fins on a rocket affect its flight?
2. What conditions produce craters?
3. How do fins on a straw rocket affect its flight?

## Chemistry

1. Which egg substitutes are best for different recipes?

2. How does temperature affect the rate of a simple reaction?
3. How does particle size affect the rate of a reaction?
4. How does temperature affect the brewing of tea?
5. Which detergent is best for removing stains?
6. What conditions are best to prevent soda from losing carbonation?

## Energy / Force

1. What type of paper makes the best paper airplane?
2. How does mass affect a pendulum swing?
3. What is the best shock absorber for dropping an egg?
4. How does the angle of impact affect patterns observed in falling water balloons?
5. What type of ball bounces the highest?
6. How does changing the height from which a ball is dropped impact its bounce?
7. How does mass affect the distance of a catapulted object?
8. What is the best shape for a parachute?
9. What is the best material to use for a parachute?
10. How does temperature affect a magnet's strength?
11. What is the best insulator to keep ice from melting?
12. How does the size of a vibrating surface affect pitch?
13. What materials conduct heat the best?
14. How does the position of a fulcrum affect the ability of a lever to do work?
15. Which conditions produce the best echo?
16. How do pulleys affect the amount of mass that can be lifted?
17. How does the surface area of a drum affect its pitch?
18. What materials are best for conducting electricity?
19. What conditions make for the fastest sailboat?
20. What conditions make a top that spins the longest?
21. How do different surfaces affect friction?
22. How does the diameter of the hose affect the speed of water in a siphon?

## Matter

1. Which paper towel absorbs the fastest?
2. How does temperature affect air pressure in a tire?
3. How does a container's size and shape affect evaporation rates?
4. How does exposure to sunlight affect the strength of a plastic bag?
5. Which types of paper have the least amount of fading in sunlight?
6. Which is the best liquid solvent for separating a marker stain?
7. Which type of microwave popcorn pops the best?
8. How does the type of liquid impact the time it takes for the liquid to freeze?
9. How does salinity affect the freezing point of liquids?
10. What is the best way to remove wrinkles from fabric?
11. How does density affect the buoyancy of objects?
12. Which brand of paper towels is the strongest when wet?
13. How does temperature affect the drying time of paint?

## Engineering Projects:

1. My backpack is too heavy to carry.
2. When I'm in a crowd, I can't see around me.

3. My juice gets warm in my lunchbox.
4. The echo in our cafeteria is so bad that it's hard to hear, even when people talk loudly.
5. Our petunias dried out last summer and died after one week.
6. We have to wait too long for the bus. We'd rather wait inside where it's more comfortable.
7. I make sandwiches ahead of time on Sunday, but by the end of the week, they go stale.
8. My younger brother and sister are too small to reach the light switches. I always have to go turn on the light for them.
9. I caught my brother in my room, but he says he never goes in there.
10. I sometimes forget my backpack.
11. Sunlight coming in windows makes the house warmer in winter. But we keep the drapes closed and forget to open them.